

THE MOST ADVANCED NAME IN DRAINAGE SYSTEMS



October 11, 2004

Mr. Alan Rawson
Administrator, Materials & Research
New Hampshire Dept. of Transportation
11 Stickney Ave.
Concord, NH 03301

RE: Eastern States Consortium Split Sample Comparative Sample Evaluation

Dear Alan:

Per the requirements specified in the Eastern States Consortium Program please accept this submittal as documentation of the split sample comparative sample evaluations that were conducted on the samples submitted from our Buena Vista, Virginia plant.

If you have any questions concerning the attached documents please do not hesitate to call me direct at (513) 896-2065. It has been a pleasure working with you and the other Eastern States Consortium members as we implement this program.

Sincerely,

A handwritten signature in cursive script that reads "Terry McElfresh".

Terry McElfresh
Quality Control Manager

CC: B. Slicker
D. Hall
J.J. Massey
D. Attig

/lkw



THE MOST ADVANCED NAME IN DRAINAGE SYSTEMS



**RE: TESTING OF (3) SAMPLES BUENA VISTA 375 MM (15") DIAMETER
SMOOTHWALL TYPE 'S' POLYETHYLENE PIPE TO AASHTO M294M-
03 FOR THE ESC PROGRAM**

CONDITIONING: Not less than 40 hours at $23 \pm 2^{\circ} \text{C}$ (73°F)

TEST RESULTS:

SECTION 6.1 BASIC MATERIALS

Results:

Sample	DENSITY (g/cm ³)	MELT INDEX (g/10 minutes)	CARBON
TRI Environmental	.953	.26	2.98
ADS	.954	.31	2.62

SPECIFICATION: Minimum Cell Class 335400C and SP-NCTL 15% 24hours
Density .945 to .955 g/cm³
Melt index .15 to .40 g/10 min.
Carbon Black Content 2% minimum / 5% Maximum
*Compounds that have a higher cell classification in one or
more properties with the exception of density are acceptable
provided product requirements are met.

CONCLUSIONS: Specification is met.

SECTION 7.1 WORKMANSHIP

SAMPLE	RESULTS
TRI Environmental	Pass
ADS	Pass

SPECIFICATION: Free of foreign inclusions and visible defects. Inner liner shall
be fused to outer corrugated wall at all internal corrugation crests.

CONCLUSIONS: Specification is met.

SECTION 7.2 PIPE DIMENSIONS
SECTION 7.2.2 WALL THICKNESS

SAMPLE	Inner Wall Thickness
TRI/Environmental	0.063"
Production	0.051"

SPECIFICATION : The minimum inner wall thickness requirement is 1.0mm
0.039"

CONCLUSIONS: Specification is met.

SECTION 7.2.3 INSIDE DIAMETER

Sample	INSIDE DIAMETER
TRI/Environmental	14.80"
ADS	14.90"

SPECIFICATION: Nominal inside diameter shall not exceed 4.5% oversize or
1.5% undersize and not more than 30mm oversize. 369.3 mm / 391.8 mm
(14.54" / 15.43")

CONCLUSIONS: Specification is met.

SECTION 7.4 PIPE STIFFNESS

Sample	Orientation	Pipe Stiffness
TRI/ Environmental	0 / 45 / 90	51 / 52 / 52
ADS	0 / 45 / 90	55 / 55 / 56

SPECIFICATION: Minimum pipe stiffness requirement at 5% deflection is
290kPa (42PSI)

CONCLUSIONS: Specification is met.

SECTION 7.5 PIPE FLATTENING

Sample	Results
TRI/Environmental	Pass
ADS	Pass

SPECIFICATIONS: No evidence of buckling, cracking, splitting or delamination.
when the vertical inside diameter is reduced by 20%.

CONCLUSIONS: Specification is met.

Section 7.6 ENVIRONMENTAL STRESS CRACKING

Sample	Results
TRI/ Environmental	Pass
ADS	Pass

SPECIFICATIONS: There shall be no cracking of the pipe.

CONCLUSIONS: Specification is met.

SECTION 7.7 BRITTLENESS

Sample	Results
TRI/Environmental	Pass
ADS	Pass

SPECIFICATION: The pipe specimens shall not crack or split.
Five non-failures out of six impacts will be acceptable.

CONCLUSIONS: Specification is met.

SECTION 7.8 FITTING REQUIREMENTS

Sample	Results
TRI/Environmental	Pass
ADS	Pass

SPECIFICATIONS: Pipe connections shall not separate to create a gap exceeding 5mm. (0.197") when measured between the bell and spigot portions of pipe fittings shall not crack or delaminate.

CONCLUSIONS: Specification is met.

SECTION 11 MARKING

Sample	MFG	SIZE	PLANT CODE	PRODUCTION DATE
TRI/Environmental	ADS	15" 375mm	B (Buena Vista)	N/A
ADS	ADS	15" 375mm	B (Buena Vista)	07/07/04

SPECIFICATION: Pipe and fitting shall be marked at intervals not more than 3.5m, manufacture's name or trademark, nominal size, AASHTO M294, plant code and date of manufacture of appropriate code.

CONCLUSIONS: Specification is met.


Terry McElfresh
Quality Control Manager



THE MOST ADVANCED NAME IN DRAINAGE SYSTEMS



**RE: TESTING OF (3) SAMPLES BUENA VISTA 600 MM (24") DIAMETER
SMOOTHWALL TYPE 'S' POLYETHYLENE PIPE TO AASHTO M294M-
03 FOR THE ESC PROGRAM**

CONDITIONING: Not less than 40 hours at $23 \pm 2^{\circ} \text{C}$ (73°F)

TEST RESULTS:

SECTION 6.1 BASIC MATERIALS

Results:

Sample	DENSITY (g/cm ³)	MELT INDEX (g/10 minutes)	CARBON
TRI Environmental	.953	.26	2.68
ADS	.954	.31	2.52

SPECIFICATION: Minimum Cell Class 335400C and SP-NCTL 15% 24hours
Density .945 to .955 g/cm³
Melt index .15 to .40 g/10 min.
Carbon Black Content 2% minimum / 5% Maximum
*Compounds that have a higher cell classification in one or
more properties with the exception of density are acceptable
provided product requirements are met.

CONCLUSIONS: Specification is met.

SECTION 7.1 WORKMANSHIP

SAMPLE	RESULTS
TRI Environmental	Pass
ADS	Pass

SPECIFICATION: Free of foreign inclusions and visible defects. Inner liner shall
be fused to outer corrugated wall at all internal corrugation crests.

CONCLUSIONS: Specification is met.

SECTION 7.2 PIPE DIMENSIONS
SECTION 7.2.2 WALL THICKNESS

SAMPLE	Inner Wall Thickness
TRI/Environmental	0.087"
Production	0.085"

SPECIFICATION : The minimum inner wall thickness requirement is 1.5mm
0.059"

CONCLUSIONS: Specification is met.

SECTION 7.2.3 INSIDE DIAMETER

Sample	INSIDE DIAMETER
TRI/Environmental	24.00"
ADS	24.05"

SPECIFICATION: Nominal inside diameter shall not exceed 4.5% oversize or
1.5% undersize and not more than 30mm oversize.
591.0 mm / 627.1 mm (23.27" / 24.69")

CONCLUSIONS: Specification is met.

SECTION 7.4 PIPE STIFFNESS

Sample	Orientation	Pipe Stiffness
TRI/ Environmental	0 / 45 / 90	35 / 35 / 37
ADS	0 / 45 / 90	38 / 38 / 39

SPECIFICATION: Minimum pipe stiffness requirement at 5% deflection is
235kPa (34PSI)

CONCLUSIONS: Specification is met.

SECTION 7.5 PIPE FLATTENING

Sample	Results
TRI/Environmental	Pass
ADS	Pass

SPECIFICATIONS: No evidence of buckling, cracking, splitting or delamination.
when the vertical inside diameter is reduced by 20%.

CONCLUSIONS: Specification is met.

Section 7.6 ENVIRONMENTAL STRESS CRACKING

Sample	Results
TRI/ Environmental	Pass
ADS	Pass

SPECIFICATIONS: There shall be no cracking of the pipe.

CONCLUSIONS: Specification is met.

SECTION 7.7 BRITTLENESS

Sample	Results
TRI/Environmental	Pass
ADS	Pass

SPECIFICATION: The pipe specimens shall not crack or split.
Five non-failures out of six impacts will be acceptable.

CONCLUSIONS: Specification is met.

SECTION 7.8 FITTING REQUIREMENTS

Sample	Results
TRI/Environmental	Pass
ADS	Pass

SPECIFICATIONS: Pipe connections shall not separate to create a gap
exceeding 5mm. (0.197") when measured between the bell and spigot portions of
pipe fittings shall not crack or delaminate.

CONCLUSIONS: Specification is met.

SECTION 11 MARKING

Sample	MFG	SIZE	PLANT CODE	PRODUCTION DATE
TRI/Environmental	ADS	24" 600mm	B (Buena Vista)	N/A
ADS	ADS	24" 600mm	B (Buena Vista)	04/05/04

SPECIFICATION: Pipe and fitting shall be marked at intervals not more than 3.5m, manufacture's name or trademark, nominal size, AASHTO M294, plant code and date of manufacture of appropriate code.

CONCLUSIONS: Specification is met.


Terry McElfresh
Quality Control Manager